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EXAMINER

HOLLOWAY III, EDWIN C

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|------------------------------------|--------------------------------|--|
| Office Action Summary | Application No. 10/803,517 | Applicant(s) KUNERTH ET AL. | |
| | Examiner Edwin C. Holloway, III | Art Unit 2612 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-35 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-9 and 11-21 is/are allowed.
- 6) ☒ Claim(s) 22-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) ✓ | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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EXAMINER'S RESPONSE

1. In response to applicant's amendment filed 7-18-06, all the amendments to the specification and claims have been entered. The examiner has considered the new presentation of claims and applicant's arguments in view of the disclosure and the present state of the prior art. And it is the examiner's opinion that the claims are unpatentable for the reasons set forth in this Office action:

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Padovani (US 5792337) in view of Townsend (US 6529127B2).

Regarding claim 22, Padovani discloses a monitoring method and apparatus including embedding passive wireless sensor apparatus in a structure to measure contaminants (col. 3 lines 30-54 and col. 4 lines 32-41), communicatively coupling a reader apparatus to the sensor apparatus (col. 5 lines 3-30), configuring the reader to communicate by short range telemetry (col. 5 line 9), energizing the sensor by inductive field from the passive state (col. 6 lines 32-39), monitoring infiltration

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and obtaining measurements (col. 3 line 44- col. 4 lines 21-32) and transmitting the measurements to the reader in a response signal superimposed on a an induction filed generated by the sensor apparatus (col. 6 lines 40-58). Although RF is described, this is considered to be an inductive link in view of the 125 kHz frequency in incorporation by reference of Schuermann for the responder and reader/interrogator communicating by resonant coils. Padovani discloses communicating the measurement from the reader to a 14 to external storage analysis system 98 by wired or wireless link in col. 7 lines 51-64, but modem is not disclosed.

If inductive link to the sensor is not clear in Padovani, then it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included such in Padovani in view of Townsend disclosing such for transferring power and data to sensors for structures, bridges, dams and buildings (col. 4 lines 18-20 and 49-58 and col. 11 line 22) and suggested by the inductive coupling in col. 7 line 63 of Padovani.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included in Padovani a sensor apparatus with plural individually polled/addressable sensors in view of Padovani disclosing such

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(col. 7 line 59 - col. 8 line 18) to reduce power use and allow plural measurements with a single transmitter/receiver.

Further regarding claim 22, the storage device of Padovani and Townsend continue to accumulate charge during at least part of the measuring because the power storage remains connected to the antenna/coil.

Regarding claim 23, the storage device of Padovani (col. 6 line 20-25) and Townsend (col. 5 line 28) are capacitors.

Regarding claim 24, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included in Padovani a processor wake a sensor to perform programmed measurements in view of Townsend disclosing such in col. 7 lines 20-35 for optimization of data sampling an tuned reader in view of Townsend disclosing such in col. 4 lines 17-37 to assure efficient power transfer. Further, individual polling would have been obvious in view of col. 8 lines 6-18 of Townsend for reduced power use.

Regarding claims 25, reverting to sleep upon transmitting would have been obvious in view of col. 8 lines 51-59 of Townsend for reduce power usage.

Regarding claim 26, measurement from individual address sensors are transmitted in col. 5 lines 45-59 of Padovani.

Regarding claim 27, 125 kHz in disclosed in col. 5 line 9

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of Padovani.

4. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Padovani (US 5792337) in combination with Di Marzio (US 20040078170A1).

Regarding claim 28, Padovani discloses a monitoring method and apparatus including embedding passive wireless sensor apparatus in a structure to measure contaminants (col. 3 lines 30-54 and col. 4 lines 32-41), communicatively coupling a reader apparatus to the sensor apparatus (col. 5 lines 3-30), configuring the reader to communicate by short range telemetry (col. 5 line 9), energizing the sensor by inductive field from the passive state (col. 6 lines 32-39), monitoring infiltration and obtaining measurements (col. 3 line 44- col. 4 lines 21-32) and transmitting the measurements to the reader in a response signal superimposed on a an induction filed generated by the sensor apparatus (col. 6 lines 40-58). Although RF is described, this is considered to be an inductive link in view of the 125 kHz frequency in incorporation by reference of Schuermann for the responder and reader/interrogator communicating by resonant coils. Padovani discloses communicating the measurement from the reader to a 14 to external storage analysis system 98 by wired or wireless link in col. 7 lines 51-64, but modem is not disclosed.

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Di Marzio discloses an analogous art system for monitoring conditions of a structure including wireless sensor modules 104 that may sense corrosion. The measurements are communicated to a repository 106 that corresponds to a reader. This reader includes a interface, such as a modem, to communicate the measurements to another location. See paragraphs 0036-0038.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included in Padovani communicating the measurements from the reader apparatus to a remote location using a modem as disclosed in Di Marzio for communication to some other location. Further the combination is suggested by Padovani disclosing different types of links from the reader to external storage and Di Marzio discloses a modem as one type of device suitable for communication interface for such links.

5. Claims 28 and 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Padovani (US 5792337) and Di Marzio (US 20040078170A1) as applied above in view of Townsend (US 6529127B2).

Regarding claims 28 and 34-35, if inductive link to the sensor is not clear in Padovani, then it would have been obvious to one of ordinary skill in the art at the time the invention

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was made to have included such in Padovani in view of Townsend disclosing such for transferring power and data to sensors for structures, bridges, dams and buildings (col. 4 lines 18-20 and 49-58 and col. 11 line 22) and suggested by the inductive coupling in col. 7 line 63 of Padovani.

It further would have been obvious to one of ordinary skill in the art at the time the invention was made to have included in Padovani a sensor apparatus with plural individually polled/addressable sensors in view of Padovani disclosing such (col. 7 line 59 - col. 8 line 18) to reduce power use and allow plural measurements with a single transmitter/receiver.

Regarding claim 30, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included in Padovani a processor wake a sensor to perform programmed measurements in view of Townsend disclosing such in col. 7 lines 20-35 for optimization of data sampling an tuned reader in view of Townsend disclosing such in col. 4 lines 17-37 to assure efficient power transfer. Further individual polling would have been obvious in view of col. 8 lines 6-18 of Townsend for reduced power use.

Regarding claim 31, reverting to sleep upon transmitting would have been obvious in view of col. 8 lines 51-59 of Townsend for reduce power usage.

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Regarding claim 32, the storage device of Padovani and Townsend continue to accumulate charge during at least part of the measuring because the power storage remains connected to the antenna/coil.

Regarding claim 33, charge for subsequent cycle would have been obvious in view of Padovani charging prior to measurement.

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Padovani (US 5792337) and Di Marzio (US 20040078170A1) in view of Townsend (US 6529127B2) as applied above and further in view of Anders (US 4656463).

Anders discloses a passive responder with a capacitor bank 102 in fig. 7 and cols. 10 and 26-27 to provide increased power when needed. Regarding claim 29, a capacitor bank would have been obvious in view of Anders to provide additional power when needed.

Allowable Subject Matter

7. Claims 1-9 and 11-21 are allowed.

The claims are allowed in response to applicant's arguments the cited references fail to teach or suggest circuitry including at least two capacitor banks, one of the capacitor

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banks providing power for short-term operations and the other capacitor bank providing power for extended operations. An advantage of Applicants' construction is that it allows sensors, which may consume a large amount of power, to collect data for a long amount of time after power from the reader has been withdrawn, for example. Further, the references fail to teach or suggest a reader apparatus that includes an antenna having a loop with a diameter above 66 inches, the loop being formed of multi-strand wires. This provides a large amount of coverage for multiple platforms. Due to the multi-strand wire in the loops, high current/high amplitude magnetic fields can be generated providing an extended working range on the order of several feet into soil, for example. The Townsend et al. reference instead discloses an exciter coil 28 having 3.5 turns 1 inch diameter of #16 A.W.G. magnet wire.

Response to Arguments

8. Applicant's arguments filed 7-18-06 have been fully considered but they are not persuasive. The arguments regarding claims 28-35 are not persuasive because a modem in the link between the reader 14 and the storage/analysis system 98 of Padovani would have been obvious in view of Di Marzio for the reasons stated in the rejection made above. Applicant's

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response lacks arguments direct to the rejection of claims 22-27. This is considered as agreement that the rejections are proper.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Caswell (US 4636950) and Nelson (6480745) disclose interrogator with modem link. Zimmerman (5649035) and McGugin (US006240783B1) disclose structure monitoring with a modem link.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

CONTACT INFORMATION

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact an Electronic Business Center (EBC) representatives at 571-272-4100 or toll free at 1-866-217-9197 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at ebc@uspto.gov. The Patent EBC is a complete customer service center that supports all Patent e-business products and service applications. Additional information is available on the Patent EBC Web site at <http://www.uspto.gov/ebc/index.html>.

Any inquiry of a general nature should be directed to the Technology Center 2600 receptionist at (571) 272-2600. Facsimile submissions may be sent via central fax number 571-273-8300 to customer service for entry by technical support staff. Questions related to the operation of the facsimile system should be directed to the Electronic Business Center.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edwin C. Holloway, III whose telephone number is (571) 272-3058. The examiner can normally be reached on M-F (8:30-5:00). If

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attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on (571) 272-7308.

EH

9/21/06



EDWIN C. HOLLOWAY, III

PRIMARY EXAMINER

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